

### **ABSTRACT**

A P-wave sensing apparatus including a printed circuit board having mounted thereon from one to three orthogonally disposed miniature sensors that function as inertia monitoring devices with respect to motion of the external supporting structures, a plurality of amplifying and filtering circuits for amplifying and filtering the outputs generated by the sensors, and a central processing unit responsive to the amplified signals and operative to generate output signals which can be used to drive optical and audible annunciators, automated data recording systems, or other device actuating systems. Each sensor is formed by a thin piezo-electric film sandwiched between two metallization layers and is laminated to a small rectangular sheet of polyester mounted in cantilever fashion with one edge thereof firmly affixed to a supporting circuit board or clamped between two flat, solid layers (such as miniature circuit boards) and then firmly affixed to the main supporting circuit board. A small mass is attached near the free end of the cantilever, improving the inertia sensing capability of the system by increasing the signal-to-noise ratio within the desired frequency range of motion